



FLORIDA GULF COAST UNIVERSITY
DEPARTMENT OF MATHEMATICS

MATHEMATICS SEMINAR

FRIDAY

OCTOBER 27TH, 2017

FLORIDA GULF COAST UNIVERSITY

ROOM 100

MARIEB HALL

11:30 PM – 12:30 PM

BOUNDS ON THE ROOTS OF PEAK AND DESCENT POLYNOMIALS



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ABSTRACT:

In 2012, Billey, Burdzy, and Sagan showed that given a positive integer n and a subset $S \subset \{1, 2, \dots, n\}$ the number of permutations of length n with peak set S is $2^{n-|S|-1} p_S(n)$, where p_S is a polynomial (now called the peak polynomial corresponding to S). In 2014, Billey, Fahrback, and Talmage conjectured that the complex roots of peak polynomials of degree $m - 1$ all lie within a circle of radius m , and they have real parts greater than -3 . In this talk I will define descent polynomials, share a conjecture that the roots of descent polynomials of degree $m - 1$ satisfy the same bounds as those identified by Billey, Fahrback, and Talmage, and discuss a number of partial results in support of these two conjectures. In the process of explaining these conjectures, I will also share some experiences from my time working students on research at FGCU ¹.

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